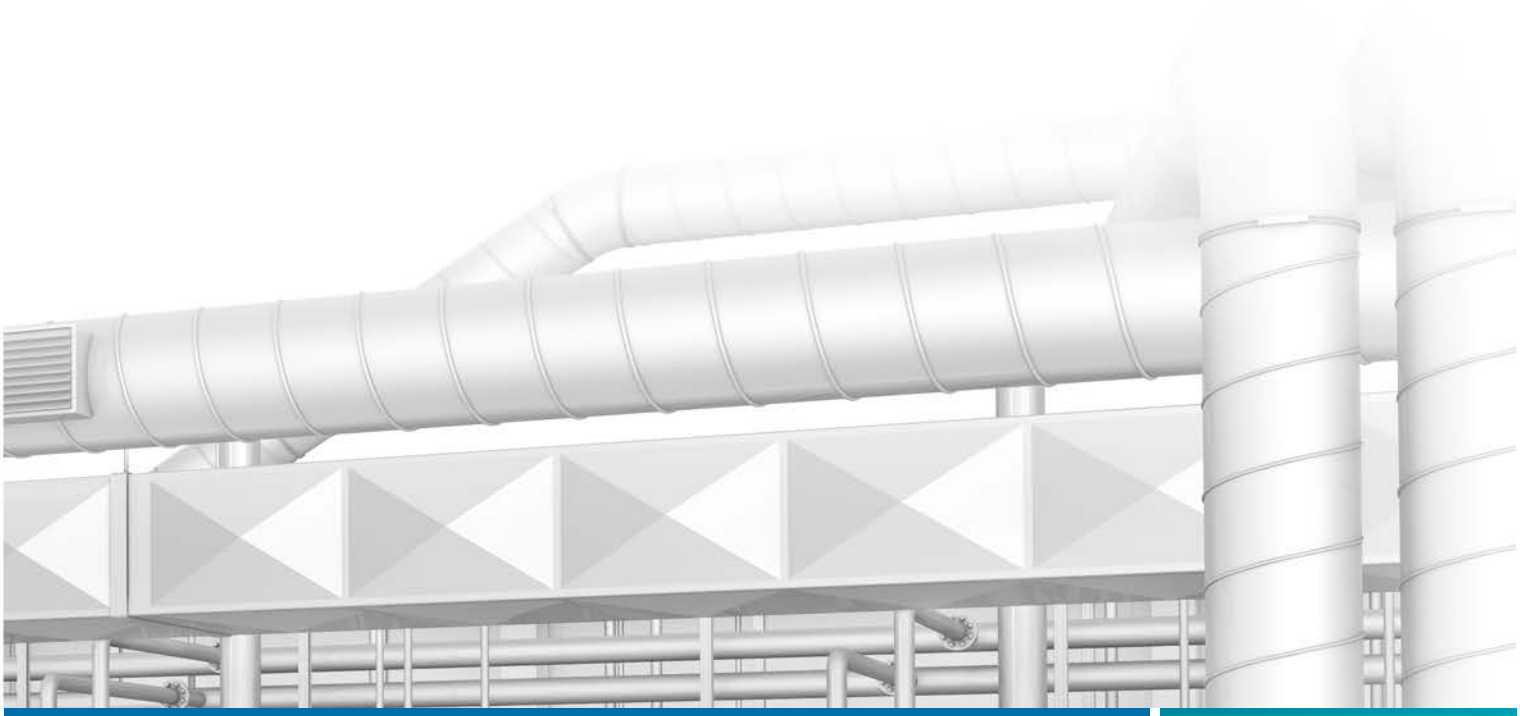
auma®

Solutions for a world in motion



AUMA INDUSTRY

Controlling, metering, shutting off - electric automation solutions for all valves

ABOUT THIS BROCHURE

Each of the five AUMA Divisions - Water, Power, Oil & Gas, Drives, Industry & Marine - focus on specific markets, on specific applications. Every single division excels by their specific competence.

This brochure deals with actuators deployed in industrial applications. The market segment is the responsibility of the Division AUMA Industry & Marine. AUMA actuators described in this brochure are particularly suited for valve automation in this market environment. The major features of the devices presented are explained including the comprehensive service performance offered by AUMA for this outstanding product range.

Further documents such as technical and electrical data sheets for detailed device dimensioning are available for all actuators referred to in this document. Our local sales/ service staff will be glad to provide you with advice and support.

The latest information on AUMA products can be found on the Internet at www.auma.com. All documents, including dimensional drawings, wiring diagrams, technical and electrical data sheets are available for free download.

AUMA's Industry & Marine Division also provides specific brochures for automation on military and civil vessels.

2019.02.12

Multi-turn actuators: Gate valves

Linear actuators: Globe valves

Part-turn actuators: Butterfly valves, ball and plug valves

AUMA - THE SPECIALIST FOR ELECTRIC ACTUATORS

Armaturen- **U**nd **M**aschinen**A**ntriebe - **AUMA** - is one of the leading manufacturers worldwide of electric actuators for automating industrial valves. Since 1964, the founding year of the company, AUMA has focussed on development, manufacture, sales and service of electric actuators.

The brand AUMA is synonym to long-standing experience and knowledge. AUMA is specialised in electric actuators for the energy, water, oil & gas, as well as industrial sectors.

As an independent partner of the international valve industry, AUMA supplies customer-specific products for electric automation of all industrial valves.

Single source supply
AUMA's goal is to offer a suitable automation solution for any valve. As a result, the product range is spearheading the market: from the compact linear actuator with a thrust of 0.6 kN to the huge part-turn actuator providing 675,000 Nm torque. The variety of interface facilities to the DCS is also unique. AUMA provides all required communication models within the process industry.

Innovation on a day-to-day-business
As specialists for electric actuators, AUMA sets the market standard for innovation and sustainability. Within the framework of continual improvement, the in-house manufacturing process ensures prompt implementation of innovation at product or sub-assembly level. This applies to all areas relating to device function - mechanics, electrical engineering, electronics, and software.

Success is reflected by growth - worldwide

Since the foundation in 1964, AUMA has evolved into a company with 2,300 members of staff around the globe. AUMA proudly possesses a global sales and service network with more than 70 sales organisations and representative offices. Customers appreciate our expertise and competence in product consultation and our efficient after-sales service.

Selecting AUMA:

> provides valve automation in compliance with submitted specifications
> assures safety for design and implementation for plant engineering on the basis of certified interfaces
> guarantees the operator global service on site including commissioning, comprehensive support, and product training

ELECTRICAL ACTUATORS IN INDUSTRIAL PROCESSES

AUMA Industry & Marine comprises the most diversified applications of all AUMA Divisions.

Medium flow control and shutting off
AUMA actuators are the perfect solution for medium flow control of any type, under any conditions, on the basis of electric power provision. Electric power supply is extremely advantageous in terms of installation, maintenance and operating costs compared with other sources of energy.

The following application descriptions represent the market segments in which AUMA Industry & Marine has specialised. However, this Division supplies many other industrial market segments. Special competence in applications for civil and military vessels are dealt with in separate brochures.

Process energy distribution
This includes all processes for temperature control, for heating and cooling, frequently in closed circuits. The energy for heating or cooling is supplied via heat transfer media like air, water, thermal oils or even fused salt.

AUMA actuators are capable of precise and swift valve position control. This is a crucial feature for demanding temperature control processes to ensure absolute reliability and achieve constant end product quality. Numerous applications depend on these requirements. They include:

> Heating/cooling systems of large motors or generators in combined block heat power plants or re-cooling systems
> Temperature control in autoclaves within the construction materials industry
> Heating/cooling systems within the steel industry
> Ventilation and cooling systems within the mining industry
> Dip temperature control within the textile industry
> Heating and cooling systems in surface engineering
> Steam generation and calander heating within the paper industry
> Low temperature control, heating/cooling systems within the food industry
> Heating/cooling systems for tanks in the chemical and pharmaceutical industry

Metering systems

Even smallest deviations in the composition of original substances can result in undesirable properties in the finished product. This is particularly valid for the petrochemical industry but also in all areas of the pharmaceutical as well as the food & beverage industry.

Required metering precision is based on homogeneous accuracy of all components within the metering system.

AUMA actuators are used for both applications, for adjusting metering pumps and for exact control of metering valves. Speed-variable actuators capable of modifying their operating speed as required are particularly suited for this type of applications.

Underground traffic facilities

Underground stations and traffic tunnels regularly rely on automated venting and flue gas dampers as crucial part of successful ventilation and desulphurisation. In the event of fire, they are the key elements for smoke exhaust. Consequently, actuator feature requirements are quite evident. High safety demands are based on a top level of reliability in all aspects. Starting with the safe reception of operation commands to executing the required actions, to ensuring safe feedback to the DCS. This also applies for actuators deployed in fire extinguishing systems.

AUMA's broad product range offers suitable actuators in terms of torque requirement or even latest data transmission technology to suit these unique solution requirements.

AUMA ACTUATORS INTEGRATION INTO TYPICAL PROCESSES

It is imperative that actuator manufacturers are familiar with process requirements and the actuators role in the control loop. Thanks to this knowledge, manufacturers are in a position to develop products with features and functions allowing integration into the available control engineering systems. This also includes actuator development as part of sensor technology.

For more than 50 years, AUMA has been successfully working in the process automation sector, both in development and enhancement, utilising their engineers comprehensive know how.

Successful process control is not just a matter of functionality. Product reliability particularly depends on the application and process conditions. AUMA products are spearheading the process industry with focused operational efficiency of functions over extended periods of time.

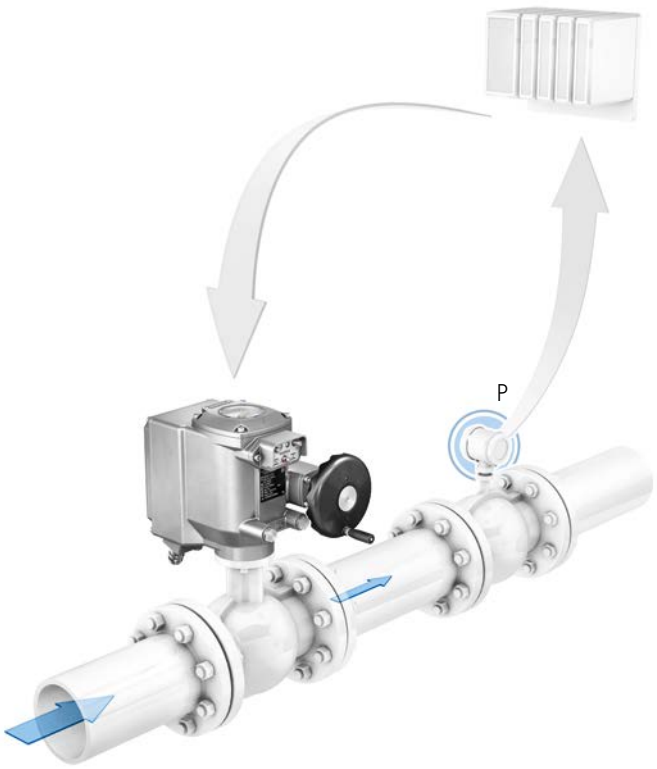
The processes shown represent typical applications and examples for integrating AUMA actuators in available systems.

These examples excel by their adapting ability to:

> Valves of all sizes and designs and consequently to other actuator sizes and actuator ranges
> More complex systems thanks to additional sensors requiring more comprehensive actuator function
> Different data transfer systems, also in redundant design, requiring availability of appropriate actuator interfaces
> Or the combination of several applications in one process as shown

AUMA is capable of satisfying any actuation demand, developing the perfect solution.

PRESSURE REGULATION WITH BUTTERFLY OR BALL VALVES



Typical applications

> Steel manufacture
> Glass manufacture

Conditions

Extremely hostile and harsh environments with increased degree of pollution and/or temperature level.

Superior reliability and dependability of components used is the prerequisite for safe plant operation.

Suitable AUMA actuators

> SQ part-turn actuators
> SGC part-turn actuators
> EQ part-turn actuators

VENTILATION CONTROL USING LOUVRE DAMPERS

Typical application
> Fire damper control in underground stations

Conditions
High temperatures in the event of fire, covering large distances in tunnels. Top level reliability are integral prerequisites of safety functions.

Suitable AUMA actuators
> SQ part-turn actuators
> SGC part-turn actuators
> EQ part-turn actuators

Special feature
Fieldbus technology in combination with fibre optic cables as transmission medium is particularly suited to cover large distances.

HEATING/COOLING CIRCUIT WITH THREE-WAY VALVES

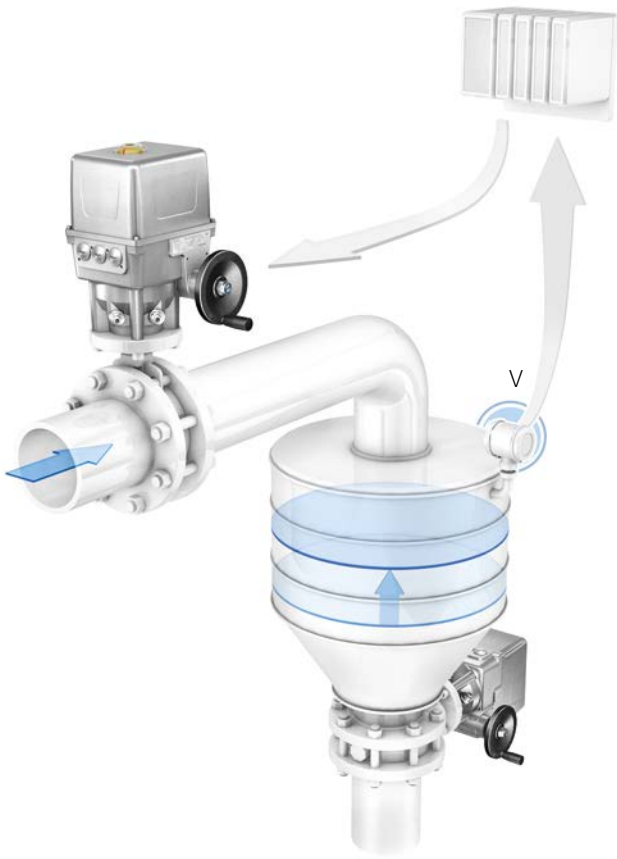
Typical applications
> Food production
> Surface engineering

Conditions
Exact temperature control strengthens quality preservation e.g. when producing deep-frozen food.

Dip temperature control is of crucial importance for surface upgrades and refinement.

Suitable AUMA actuators
> SBA linear actuators
> SDL linear actuators

DISTRIBUTION WITH BALL OR BUTTERFLY VALVES



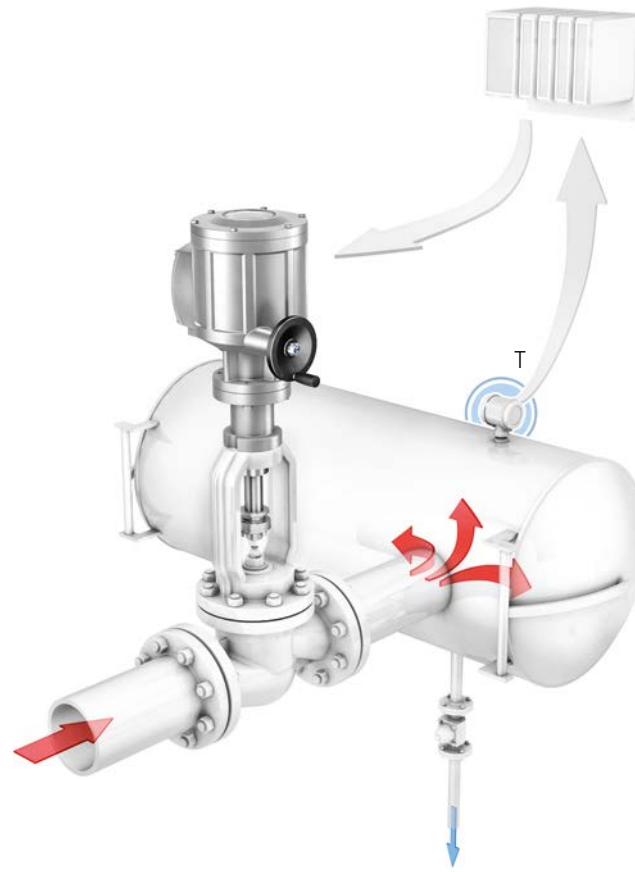
Typical applications
> Sugar industry

Conditions
Shutting-off and distributing media flows.

Suitable AUMA actuators
> SGC part-turn actuators
> EQ part-turn actuators

Special feature
Networking actuators by means of fieldbus technology is a significant benefit for large installations.

STEAM CONTROL WITH GATE VALVES



Typical applications
> Autoclaves within the construction materials industry

Conditions
Autoclave control makes high demands on actuators in terms of varying energy requirements.

Suitable AUMA actuators
> SVC linear actuator
> SDL linear actuator

Plant operators aim at maximising plant life cycles whilst achieving supreme economic benefits. Consequently, the initial investments play a crucial role. With time, a certain number of other factors are to be considered. AUMA places a particular focus on these factors during product design, development, manufacture and service.

MAXIMUM AVAILABILITY

Simply reliable, highest safety and highest availability considerably contribute in maximising efficiency. Our actuators are designed and life tested to withstand hostile industrial environments.

SUPERIOR PRODUCTIVITY

DCS connection provides comprehensive information on your plant. All valve types can be automated using the same interface resulting in considerable time savings in terms of commissioning and maintenance.

PRESERVED PRODUCT QUALITY

With the sustainable impact on product quality by thermal processes, we help you to preserve your product quality at maximum level. The actuators are designed for complex positioning tasks requiring utmost precision and repeatability.

REDUCING OPERATING COSTS

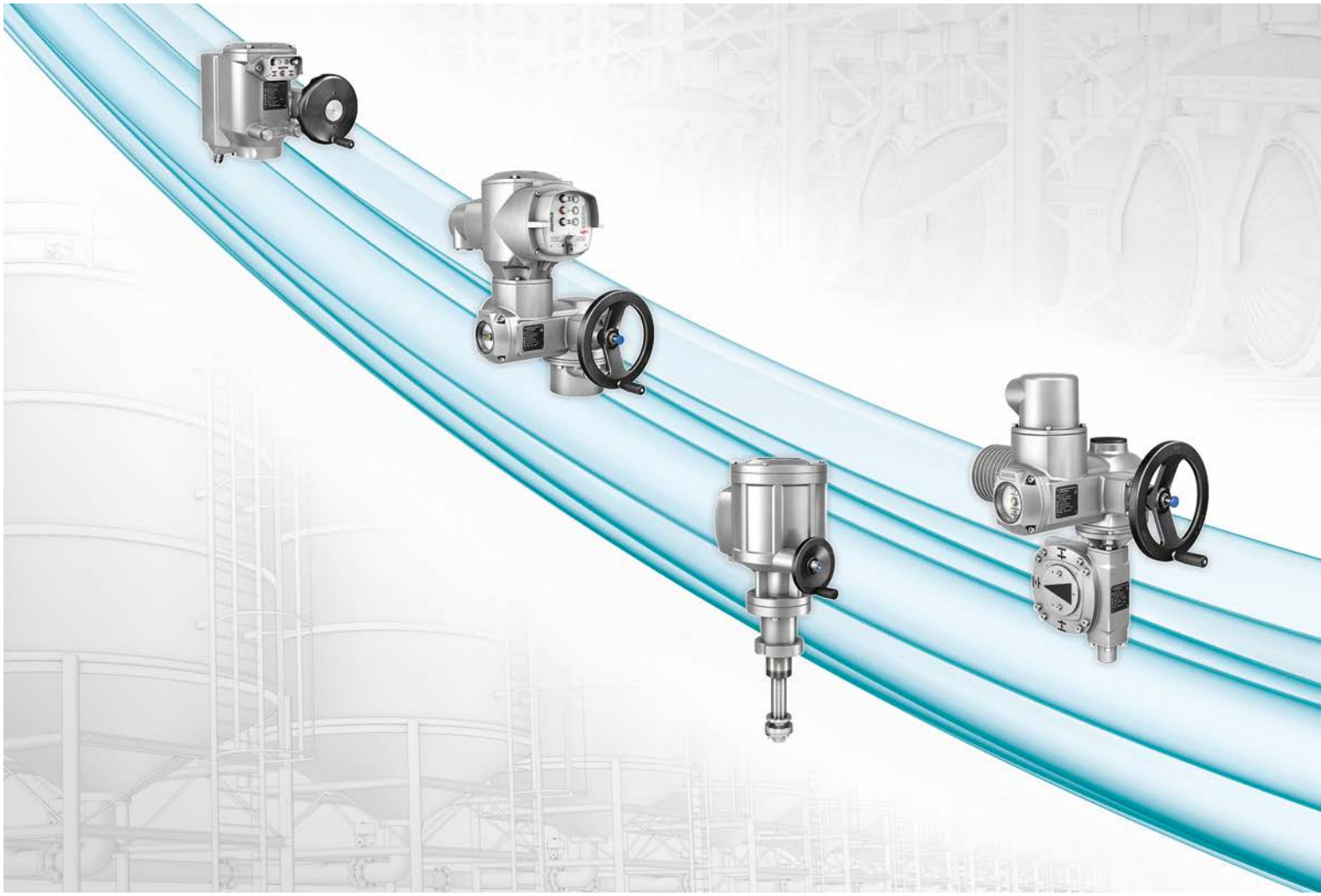
Electrical actuators contribute twice to reducing your operating expenses. On the one hand, they excel by their superior control properties compared to other systems, on the other hand, electric actuators require less energy than for example their pneumatic counterparts.

SIMPLE AND SAFE POWER SUPPLY

Compared to pneumatic or hydraulic cables, electrical cables are exempt of any mechanical components such as valves, flanges and seals which are usually subjected to pressure under normal operation.

SUSTAINABLE SOLUTIONS FOR THE FUTURE

With our innovative operation concept and actuation technologies as well as with our communication interfaces, we are at the forefront of valve automation. This makes us your expert partner - worldwide.



AUMA ACTUATORS - BASIC FEATURES

Media with different physical conditions - low or high, fixed or variable pressures, fast or quick, hot or cold - are transported through valves. Their diameters can range from just a few centimetres to several metres. The flow rate is controlled or the pipe is just opened or shut-off.

In some large plants, many actuators work in networks via fieldbus with Asset Management systems. In other systems, individual devices cooperate while receiving simple operation commands OPEN and CLOSE via the control room - this makes the comprehensive application range of DCS requirements quite clear.

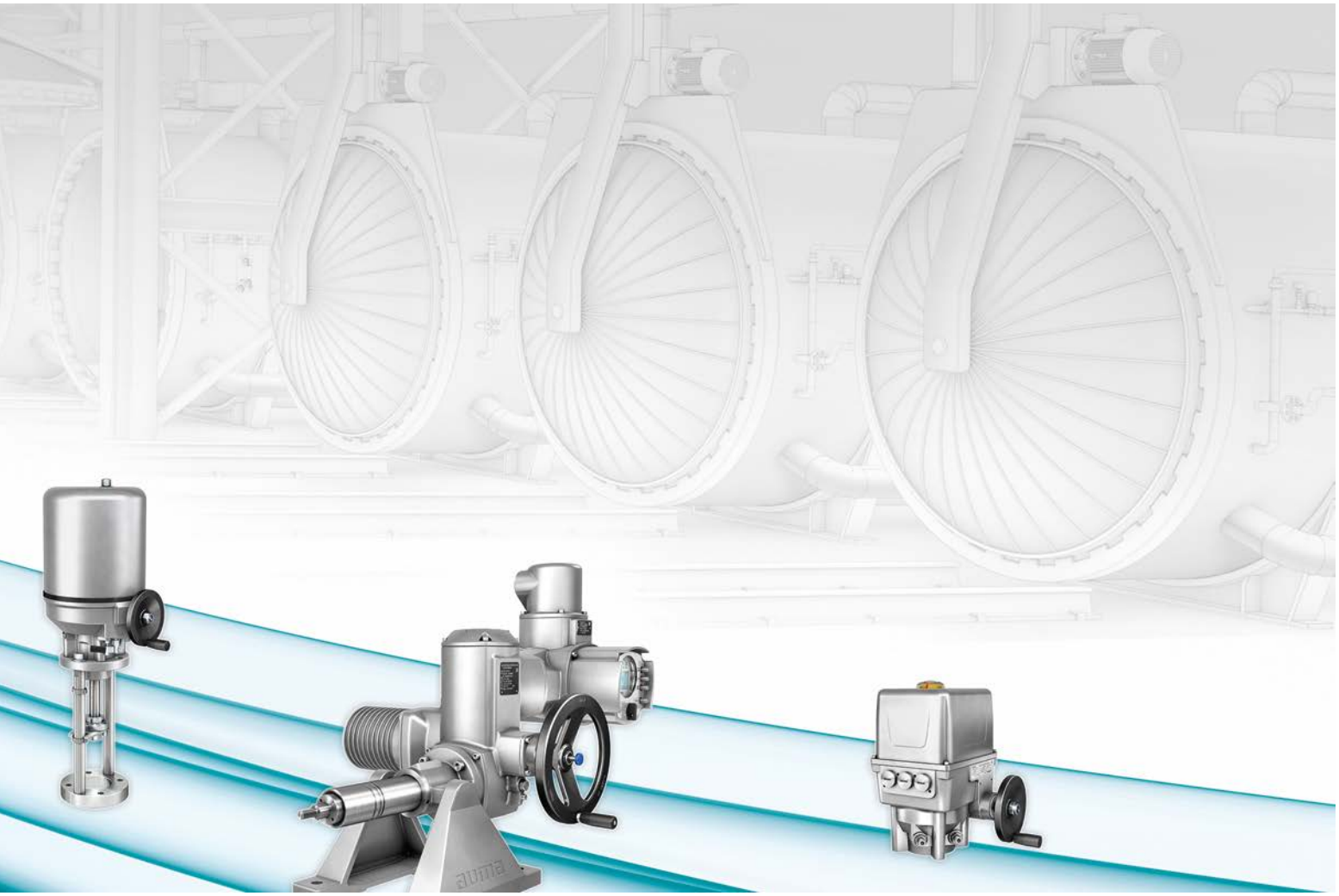
As a consequence, there are numerous possible configurations and the most suitable actuator solution must be identified. AUMA's different product families allow swift selection of the most suitable electric actuator with correct, control, operation, speed and torque range to give accurate reliable operation throughout the complete product life.

SERVICE CONDITIONS

The continuous robustness and resistance against severe environmental impacts on site are some of the crucial features across all product families. Well-thought-out design, using premium material and monitored production are the prime requirements.

Therefore, AUMA actuators are deployed all around the globe, in any climatic zone, on land and under water.

Compact design
Compared to other actuator types, the space-saving design of electric actuators is ideally suited when space available is scarce. All components are located in one housing. Space constraints are consequently one of the prime benefits of electric actuators.



Ambient temperatures
Irrespective of the ambient environment – hot or cold – AUMA actuators guarantee reliable service. Various temperature versions are available to suit various ambient environments.

Across all type ranges, the mission temperature ranges from –40 °C to +70 °C.

Corrosion protection
AUMA actuators are used in any type of location: from the heated and dry cellar indoors to outdoor installation on offshore drilling rigs. AUMA devices with appropriate corrosion protection are available to suit any environmental conditions.

In compliance with standardised classification according to ISO 12944-2 from

> category C2: Unheated buildings and rural areas with low level of pollution
> right through to
> highest category C5-M: Coastal and offshore areas with high salinity, almost permanent condensation and with high pollution

Enclosure protection types
The enclosure protection feature situation is comparable to the corrosion protection. AUMA actuators are available with the highest possible enclosure protection IP68 if required for the specific application.

Explosion protection
For applications in potentially explosive atmospheres, different type ranges with worldwide valid explosion protection certifications are approved.

BASIC RANGE

Simple control and basic functions as well as feedback signals – these are the major characteristics required by our customers. BASIC Range actuators ensure reliable service over many years, following the install and forget philosophy. Operation commands and setpoints are implemented by means of binary or analogue voltage or current signals.

In the event of power failure, the valve can be operated by manual emergency operation included as standard. Device handling is intuitive and simple - for the rare occasions when manual intervention by the operator is required.

SBA linear actuators
High positioning accuracy - the perfect choice for modulating applications.

> Seven sizes
> Thrust range:
  0.6 kN – 25 kN
> Stroke range:
  35 mm – 100 mm

Applications: Temperature control, combustion control, Pelton turbine control, refuelling management on ships

For further information, refer to page 18.

ED/EQ part-turn actuators
Simple and reliable part-turn actuators for open-close and modulating duty

> Eight sizes
> Torque range: 25 Nm – 600 Nm
> Swing angle range:
  90° – 180°

Applications: Louvre dampers in ventilation systems, shut-off valves in the food industry or hydropower plants.

For further information, refer to page 22.

SMART RANGE

Variable-speed actuators for modulating applications requiring high positioning accuracy and/or for integration into DCS placing higher demands on the functionality of the field devices.

Speed control is used for soft starts and stops acting gently on all mechanical components. Operation profiles with variable speed help to avoid critical states within the valve such as pressure surges or cavitation.

Consequently, the actuators can be integrated into all conventional DCS structures and special conditions can be considered for these applications.

SDL/SDG linear actuators
Actuators for automating control valves fulfilling highest demands regarding positioning accuracy. A wide range power supply input caters for utmost power supply flexibility.

> Three sizes
> Thrust ranges: 4 kN – 15 kN
> Stroke ranges:
  55 mm – 300 mm

Applications: Metering pumps/ pump systems, precise temperature control

For further information, refer to page 28.

SGC part-turn actuators and SVC globe valve actuators
High torques at higher operating speeds. SGC and SVC actuators are ideally suited for fast opening and closing. Internal speed control nevertheless protects the mechanics of actuator and valve.

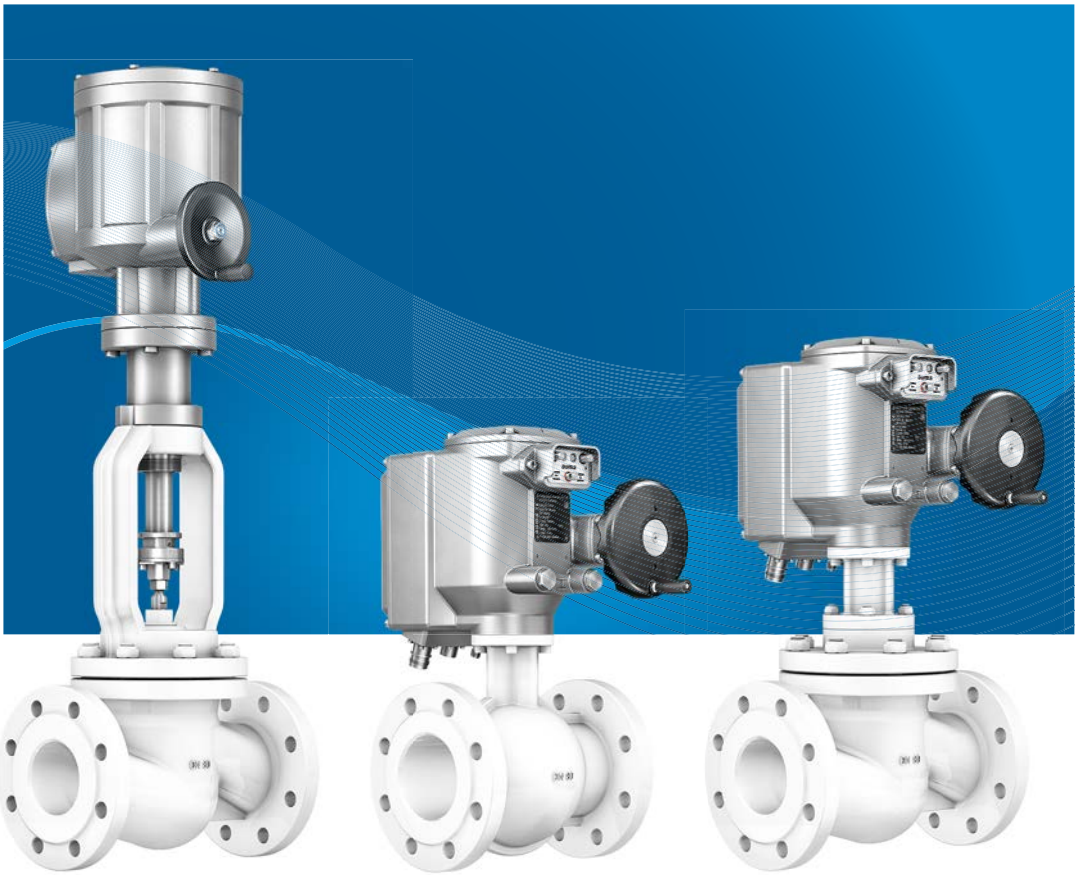
SGC part-turn actuators
> Five sizes
> Torque range:
  25 Nm – 1,000 Nm
> Swing angle ranges:
  82° – 98°

Applications: Shut-off valves in water treatment plants, bulk handling systems, fire-fighting systems

SVC globe valve actuators
> Three sizes
> Torque ranges:
  10 Nm – 100 Nm
> Stroke ranges:
  60 mm and 70 mm

Applications: Shut-off valves, control valves for pressure or level control

For further information, refer to page 32.



BASIC RANGE

Getting down to essentials

> Swift and precise positioning
> Limit seating
> Thrust/torque monitoring
> Reliability
> Simple functionality
> Fail safe version
> Optional fieldbus interface

BASIC RANGE - SBA LINEAR ACTUATORS

Simple opening and closing valves. Simple precise positioning. Simple DCS integration. Simply reliable and dependable.

SBA is the perfect actuator choice when requiring simple and straightforward automation. The proven mechanics paired with prime basic functions is the SBA principle.

Each SBA size is available in stall-proof version for continuous operation. Combined with high positioning accuracy, SBA actuators are often deployed in heating and cooling systems for demanding temperature control.

The actuators are specifically designed for harsh industrial missions. Thanks to their premium reliability and dependability. The motto for plant operators is quite simple: install and forget.

Besides the limit seating feature in end positions, thrust is monitored. If the actuator is demanded to exceed the preset thrust threshold, because an object is jammed in the valve for example, the actuator automatically switches off, thus protecting both itself and the valve.

SERVICE CONDITIONS

Corrosion protection
> Standard: C2 according to EN ISO 12944-2
> Option: C3/C4 according to EN ISO 12944-2

Ambient temperatures
> Standard: –20 °C to +60 °C
> Option: –40 °C to +60 °C

Enclosure protection
> IP43 (SBA 06-1/-2/-3)
> IP54 (SBA06-4)
> IP65 (SBA 12 – SBA 200)

TECHNICAL DATA

Type	Operating speed at 50 Hz	Thrust	Stroke	Type of duty	Number of starts max.	Valve attachment
	[mm/min]	[kN]	Max.[mm]	Type of duty	[1/h]	EN ISO 5210 DIN 3210
SBA 06-1	8	0.6	35	S1 - 100 %	1,200	F05
	10					
SBA 06-2	13.2	0.9				
	16					
SBA 06-3	20	1.2				
SBA 06-4	8	2.0				
	10					
	13.2					
SBA 12	25	1.2	75	S1 - 100 %	1,200	F05
SBA 20	15	2.0	75	S1 - 100 %	1,200	F05
SBA 45-2	25	3.5	75	S1 - 100 %	1,200	F05
	50					
SBA 45-3	25	4.5				
	50					
SBA 45-4	17	6.0				
	34					
SBA 80-1	13.5	6.0	80	S1 - 100 %	1,200	G0
SBA 80-2	25	8.0				
SBA 80-3	50	12		S3 - 50 %	600	
SBA 80-4	13.5	15		S1 - 100 %	1,200	
	22					
	40			S3 - 50 %	600	
SBA 200-1	15	15	100	S1 - 100 %	1,200	G0
SBA 200-2	25	20		S3 - 50 %	600	
	50					
SBA 200-3	25	25				

POWER SUPPLY

Type of current	Voltage/frequency
3-phase AC	50 Hz: 380 V; 400 V 60 Hz: 400 V; 440 V
1-phase AC	50 Hz: 230 V; 24 V; 115 V 60 Hz: 220 V; 24 V; 110 V
DC current	24 V

INTERFACE TO THE DCS

Basic version
Two end position switches to cut-off the actuator upon reaching the end position

Options
> Two additional limit switches for end position signalling
> Two digital inputs for operation commands Run OPEN and Run CLOSE in combination with reversing contactors
> Positioner for analogue current and voltage signal
> Position feedback as voltage or current signal
> Integrated Profibus DP-V0 interface

1 Hood
Made of steel in standard version. Available in aluminium as an option. The hood is removed by unfastening the centre screw for subsequent connection of the actuator to the power supply and to perform end position setting.

2 End position seating
As standard, load-dependent end position switches 2a are integrated allowing actuator cut-off when reaching the end position.

Alternatively, cut-off can be performed via optional limit switches, 2b operated via cams. Thanks to these switches, precise setting of switching points across the complete stroke range is possible. Up to four additional limit switches can be integrated.

Integral reversing contactors (option)
Refer to EQ part-turn actuators on page 24. As standard, the end position switches are connected to external controls where the motor is cut-off via external reversing contactors when reaching the end position. Available as an option, the reversing contactors can be integrated into the actuator. The cut-off is then performed by the actuator.

3 Position feedback signal (option)
Either via a potentiometer or in case of larger distances as 0/4 – 20 mA signal, generated by an electronic position transmitter in 2-wire, 3-wire or 4-wire technology.

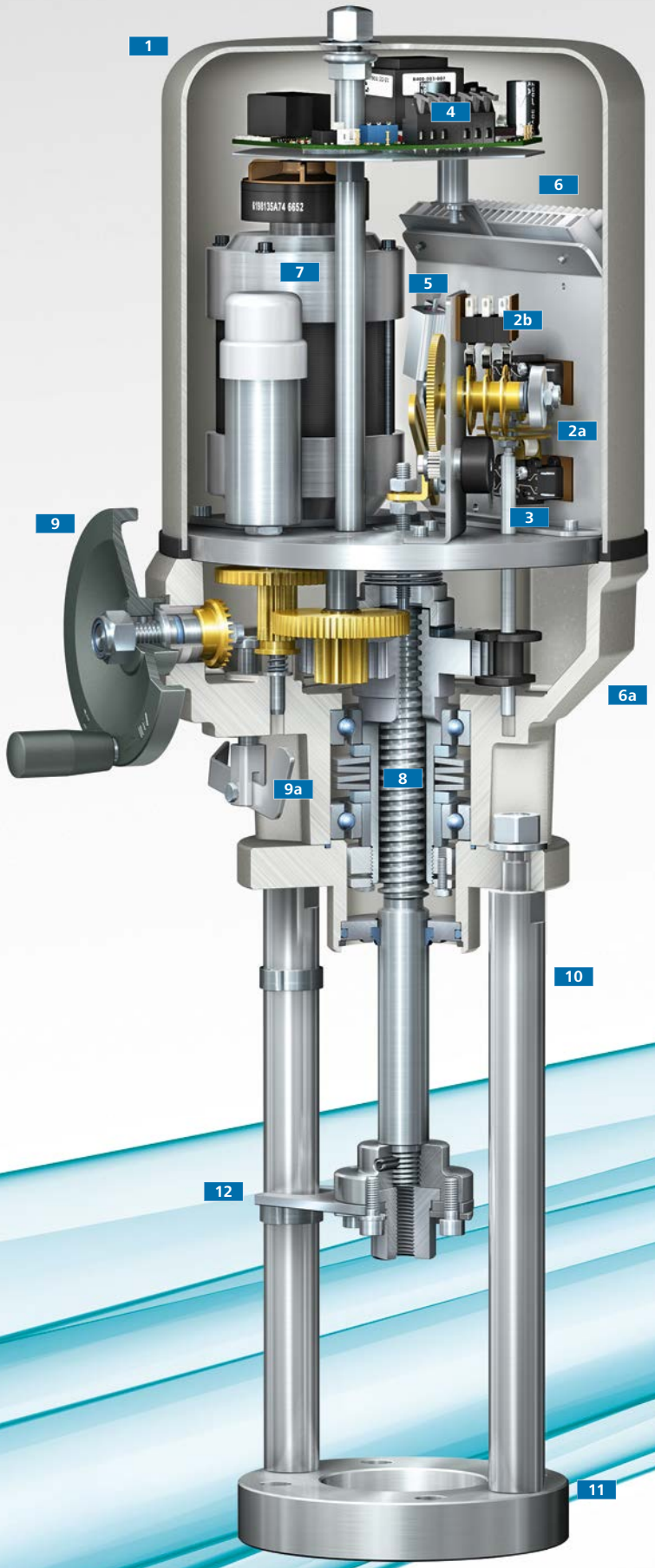
4 Positioner (option)
Positions the actuator in compliance with an external setpoint signal. The setpoint is selected as 0 – 10 V or 0/4 – 20 mA signal. In combination with a positioner, position feedback is performed using the same signals.

5 Heater (option)
To reduce device-internal condensation.

6 Electrical connection
For electrical connection of power supply and control cables. Connection is made using standard terminal blocks. Cable entries 6a are located in the lower part of the housing. Cable glands are not part of the AUMA delivery and must be selected in compliance with the desired enclosure protection.

7 Motor
Depending on the version selected, the robust motors are synchronous or asynchronous with fixed speeds. Thermoswitches are integrated to protect against excessive temperatures allowing actuator cut-off if required. As an option, many actuator types are available with stall-proof motor.

8 Stem drive
Several gear stages transmit the motor or handwheel rotary movement to a hollow shaft equipped with an internal stem. The counterpart is a thrust rod equipped with an external stem. This creates the linear movement. The ball bearing of the hollow shaft considerably contributes to the superior efficiency. The pre-tensioned axial spring system eliminates gear backlash and consequently allows for high actuator positioning accuracy.



9 Handwheel
For emergency actuator operation in the event of power failure. Motor is disengaged and handwheel operation engaged when operating the change-over lever 9a.

10 Pillar yoke (option)
Available in different lengths and pillar distances.

11 Valve attachment
The valve attachment for mounting on the valve is designed according to EN ISO 5210.

12 Position indicator (option)
The optional distortion lock of the thrust rod acts simultaneously as position indication.

Local controls (option)
Refer to EQ part-turn actuators on page 25. The desired control mode is defined via MANUAL/AUTO selection. If MANUAL is selected, the actuator can be operated locally via buttons OPEN and CLOSE.

BASIC RANGE - ED/EQ PART-TURN ACTUATORS

The perfect solutions to operate shut-off butterfly and ball valves or venting and flue gas dampers. Superior positioning accuracy makes the ED/EQ series the perfect choice for automating control butterfly and ball valves.

Like all AUMA actuators, ED/EQ actuators excel by their well thought-through design and use of premium materials. This guarantees reliable operation over years requiring minimum maintenance.

The actuators get down to essentials in terms of functionality. When the prime focus is on basic functions like precise opening, closing or controlling butterfly and ball valves, ED/EQ actuators are your perfect choice.

The self-retaining feature within the actuators ensures that the valve position is maintained even without power, also in case of force impact at the closing element. This often occurs with butterfly valves in intermediate positions caused by the media flow.

SERVICE CONDITIONS

Corrosion protection
> Standard: C2 according to EN ISO 12944-2
> Option: C3/C4 according to EN ISO 12944-2

Enclosure protection
> Standard: IP67
> Option: IP68

Ambient temperatures
> Standard: –20 °C to +70 °C
> Option: –40 °C to +70 °C

TECHNICAL DATA

Consider the limits of type of duty S2 - 15 min (class A) in open-close duty. S4 - 50 % applies to modulating duty paired with a maximum number of starts of 1,200 per hour

Type	Operating time for 90° at 50 Hz	Open-close duty	Modulating duty	Valve attachment
	[s]	Maximum torque [Nm]	Maximum modulating torque [Nm]	Standard EN ISO 5211
ED 25	15	25	25	F03; F04; F05; F07
	30			
	70			
ED 50	15	50	50	F03; F04; F05; F07
	30			
	70			
EQ 40	15	40	20	F04; F05; F07; F10
	30			
	60			
EQ 60	20	60	40	F05; F07; F10
	30			
	60			
EQ 100	20	100	60	F05; F07; F10
	30			
	60			
EQ 150	20	150	80	F05; F07; F10
	30			
	60			
EQ 300	40	300	180	F07; F10; F12
	80			
	160			
EQ 600	80	600	300	F07; F10; F12
	160			

POWER SUPPLY

Type of current	Voltage/frequency
3-phase AC	50 Hz: 380 V; 400 V 60 Hz: 400 V; 440 V
1-phase AC	50 Hz: 230 V; 24 V; 115 V 60 Hz: 220 V; 24 V; 110 V
DC current	24 V

INTERFACE TO THE DCS

Basic version
> Two end position switches to cut-off the actuator upon reaching the end position
> One torque switch each per direction to switch off the actuator when reaching the tripping torque

Options
> Two additional limit switches for end position signalling
> Two additional torque switches
> Two digital inputs for operation commands Run OPEN and Run CLOSE in combination with reversing contactors
> Positioner for analogue current and voltage signal
> Position feedback as voltage or current signal
> Integrated Profibus DP-V0 interface
> Emergency operation module for performing a predefined emergency operation

1 Hood
Made of polycarbonate in standard version. Available in aluminium as an option. The hood is removed by unfastening the four screws for subsequent connection of the actuator to the power supply and to perform end position setting.

2 End position switches
Both end position switches are operated via cams. They are set at the time of commissioning. An additional end switch per end position can be integrated as an option.

3 Integral reversing contactors (option)
As standard, the end position switches are connected to external controls where the motor is cut-off via external reversing contactors when reaching the end position. Available as an option, the reversing contactors can be integrated into the actuator. The cut-off is then performed by the actuator.

4 Position feedback signal (option)
Either via a potentiometer or in case of larger distances via 0/4 – 20 mA signal, generated by the electronic position transmitter.

Positioner (option)
Refer to SBA linear actuators on page 20. Positions the actuator in compliance with an external setpoint selection. The setpoint is selected as 0 – 10 V or 0/4 – 20 mA signal. In combination with a positioner, position feedback is performed using the same signals.

5 End stops
For multi-turn valves, they limit the travel and allow precise approaching of end positions during manual operation. At the time of commissioning, end stops are set to the desired position.

Heater (option)
Refer to SBA linear actuators on page 20. To reduce device-internal condensation.

6 Electrical connection
For electrical connection of power supply and control cables. Connection is made using standard terminal blocks. Cable glands are not part of the AUMA delivery and must be selected in compliance with the desired enclosure protection 6a.

7 Motor
Robust synchronous motor with fixed output speed. Thermoswitches are integrated to protect against excessive temperatures allowing actuator cut-off if required. As an option, many actuator types are available with stall-proof motor.

8 Gearing
Planetary gearing for reducing the high motor speed into the required output speed.

9 Valve attachment
The valve attachment for mounting on the valve is designed according to EN ISO 5211.

10 Coupling
For torque transmission to the valve shaft. During assembly, the coupling is simply pushed onto the valve shaft and secured against axial movement. In the next step, the actuator is placed onto the coupling and screwed to the valve flange. Upon request, the coupling is supplied with a suitable bore in accordance with the valve drive coupling.

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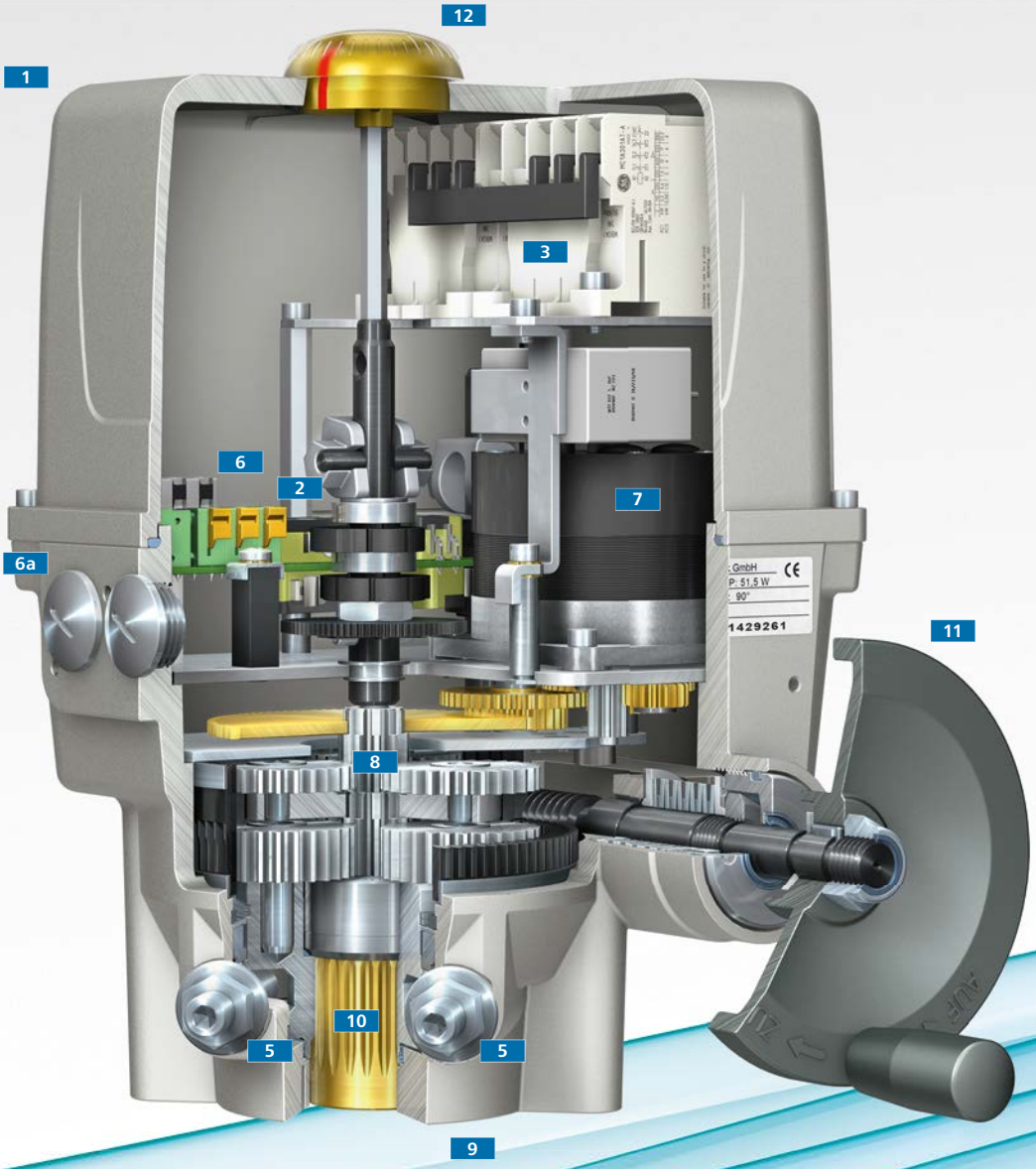

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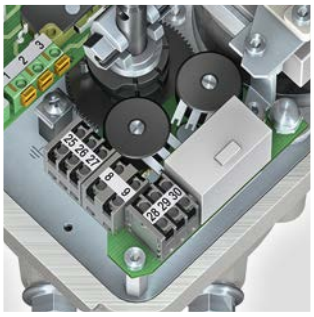


11 Handwheel
For emergency actuator operation in the event of power failure. The handwheel does not rotate during motor operation.

Single-handed handwheel operation is possible.

12 Position indication
Local indication of current valve position.

13 Local controls (option)
The desired control mode is defined via MANUAL/AUTO selection. If MANUAL is selected, the actuator can be operated locally via buttons OPEN and CLOSE.

SMART RANGE

When you need excellent precision!

> Variable-speed actuators
> Gentle approaching of end positions
> Speed profiles to prevent cavitation and pressure surges
> Local controls
> Optional integration into fieldbus systems

SMART RANGE - SDL/SDG LINEAR ACTUATORS

Like for all SMART Range actuators, SDL/SDG linear actuators excel by their variable speed feature. When placing the major focus on highest precision, SDL/SDG actuators are your first choice. This is the case for high precision temperature control or exacting dosing procedures, for example.

Sensitive and highly precise in their basic functions on the one hand - robustness against harsh environmental conditions on the other hand. High precision is also required in hostile environments; SDL/SDG actuators can be deployed in cement plants to oil production on the Arabic peninsula. High precision is also required in hostile environments.

The electronic settings include among others: thrust, speed, number of turns or the type of seating.

High efficiency is paired with low energy consumption. SDL/SDG actuators are particularly suited for remote sites without direct connection to the mains. Thanks to the extremely low power requirements, the devices can easily be supplied by self-sufficient systems like, for example, solar PV power systems.

The wide range power supply input allows connection of different supply voltage and consequently, the actuator is insensitive against voltage fluctuations.

SERVICE CONDITIONS

Corrosion protection

> Standard: C2 according to EN ISO 12944-2
> Option: C3/C4 according to EN ISO 12944-2

Enclosure protection

> Standard: IP67
> Option: IP68

Ambient temperatures

Standard	Size
–20 °C to +60 °C	SDL 50-10/SDL 50-20/SDL 100-20/SDG 40-13/SDG 40-23
–20 °C to +55 °C	SDL 50-30/SDL 100-30
Option	
–40 °C to +60 °C	SDL 50-10/SDL 50-20/SDL 100-20/SDG 40-13/SDG 40-23
–40 °C to +55 °C	SDL 50-30/SDL 100-30

Explosion protection

II 2G EEx de IIB T4 according to EN 60079-1

TECHNICAL DATA

The indications apply for intermittent duty S4 - 30 % with maximum of 1,200 starts per hour.

Type	Operating speed		Thrust	Stroke	Valve attachment
	Min. [mm/s]	Max. [mm/s]	Max. [kN]	Max.[mm]	EN ISO 5210
SDL 50-10	0.2	0.5	5.0	55	F05
SDL 50-20	0,4	2.5	4.0	55	F05
SDL 50-30	1.2	7.0	2.5	55	F05
SDL 100-20	0.3	1.8	6.0	85	F07
SDL 100-30	0.3	1.8	10	85	F07
SDG 40-13	0.3	0.7	2.0	300	F10
SDG 40-23	0.2	1.2	4.0	300	F10

When combining the actuator with a shut-off valve, higher operating forces and short-time duty S2 - 15, class A apply (refer to separate technical data sheets).

POWER SUPPLY

Type of current	Voltage/frequency
1-phase AC	50 Hz: 100 V – 240 V 60 Hz: 100 V – 240 V
3-phase AC	50 Hz: 100 V – 500 V 60 Hz: 100 V – 500 V
DC current	24 V

For 1-phase and 3-phase AC actuators, the supply voltage may fluctuate within the specified voltage range thanks to the wide range power supply input.

INTERFACE TO THE DCS

Basic version

> Analogue input for specified target value
> Three galvanically isolated control inputs for operation commands Run OPEN, STOP and Run CLOSE.
> Analogue output for position feedback signalling
> Collective fault signal

Option

> Modbus RTU interface

1 Housing
Made of aluminium. Explosion-proof actuators are equipped with housings in flameproof enclosure.

2 Logic board with display
The logic board collects the actuator position as well as external operation signals to generate the required motor operation signals.

The logic board processes setpoint signals 0/4 – 20 mA or 24 V DC for operation commands OPEN and CLOSE. Furthermore, the valve position is supplied as 0/4 – 20 mA feedback signal to the DCS.

The logic board contains the contactors for local actuator operation and for menu-controlled parameterization. The display is used to define a.o. the stroke range, the operating speed and the type of seating. For normal operation, the display indicates the actual value and the setpoint value in percent.

3 Power board
Comprises all components to control the brushless DC motor. In compliance with the preset speed, a rotary field is generated on the power board. This board further comprises the force reversal system.

4 Motor
Brushless DC motor. Thanks to the permanent magnetic motor design, the motor supports the actuator self-retaining function. Consequently, overrun after motor cut-off can be neglected.

5 Power supply unit
Equipped with wide range power supply input without requiring further adaptation, the actuators are fit for virtually all supply voltage systems. Further advantage: Actuators are insensitive against voltage fluctuations.

I/O board (option)
Supplies further end position feedback signals if required.

6 Absolute encoder
For contactless and continuous valve position recording.

7 Electrical connection
For electrical connection of power supply and control cables. Connection is performed by means of spring-loaded terminal rails, available in explosion-proof protection type increased safety.

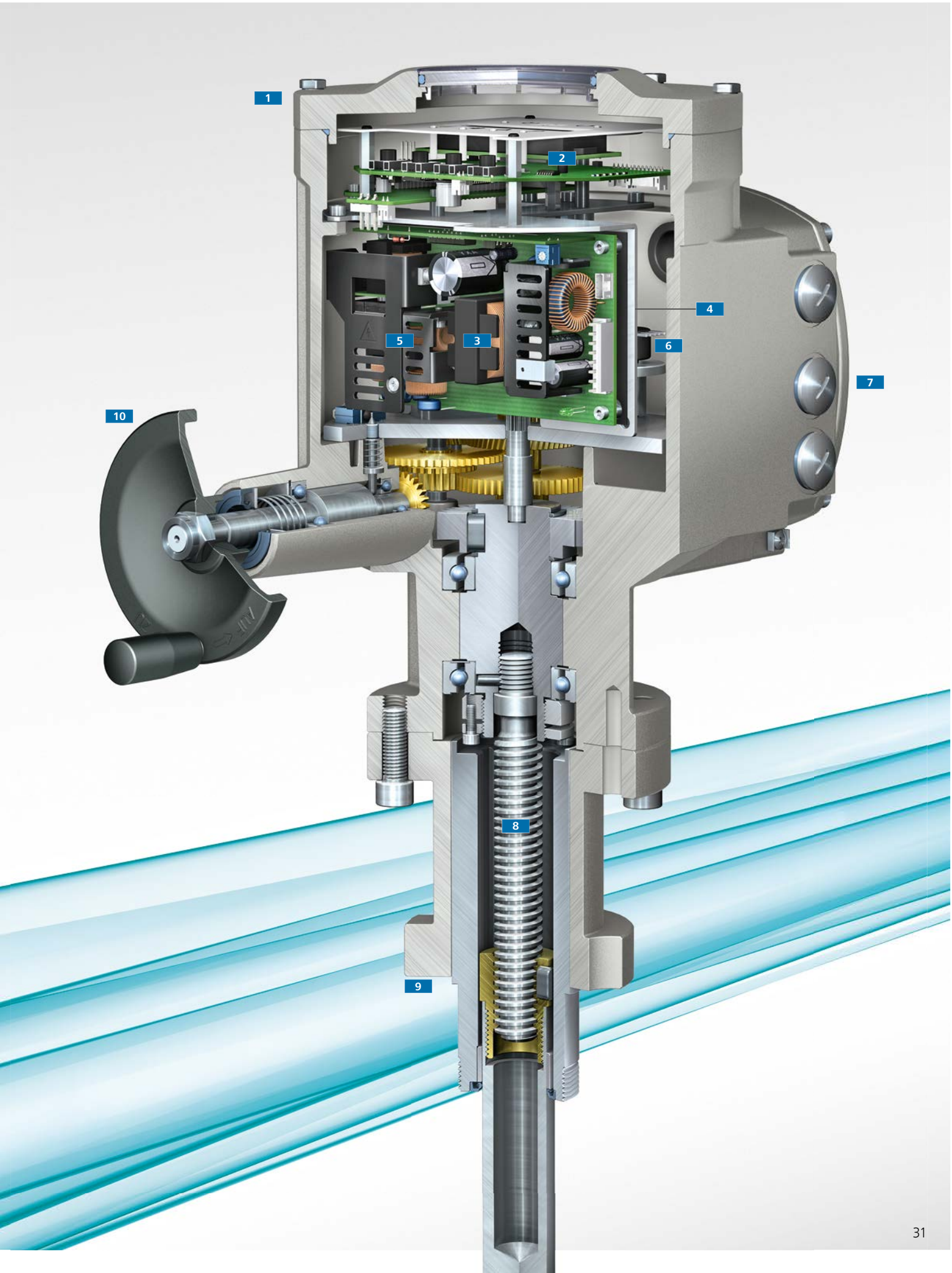
Cable glands are not part of the AUMA delivery and must be selected in compliance with the desired enclosure protection.

8 Stem drive
Several gear stages transmit the motor or handwheel rotary movement to a threaded stem. The thrust rod as counterpart is designed as hollow shaft with internal stem. Two parallel keyways act as distortion lock. This creates the linear movement.

9 Valve attachment
The valve attachment for mounting on the valve is designed according to EN ISO 5210.

10 Handwheel
For emergency actuator operation in the event of power failure. The handwheel does not rotate during motor operation.

Single-handed handwheel operation is possible.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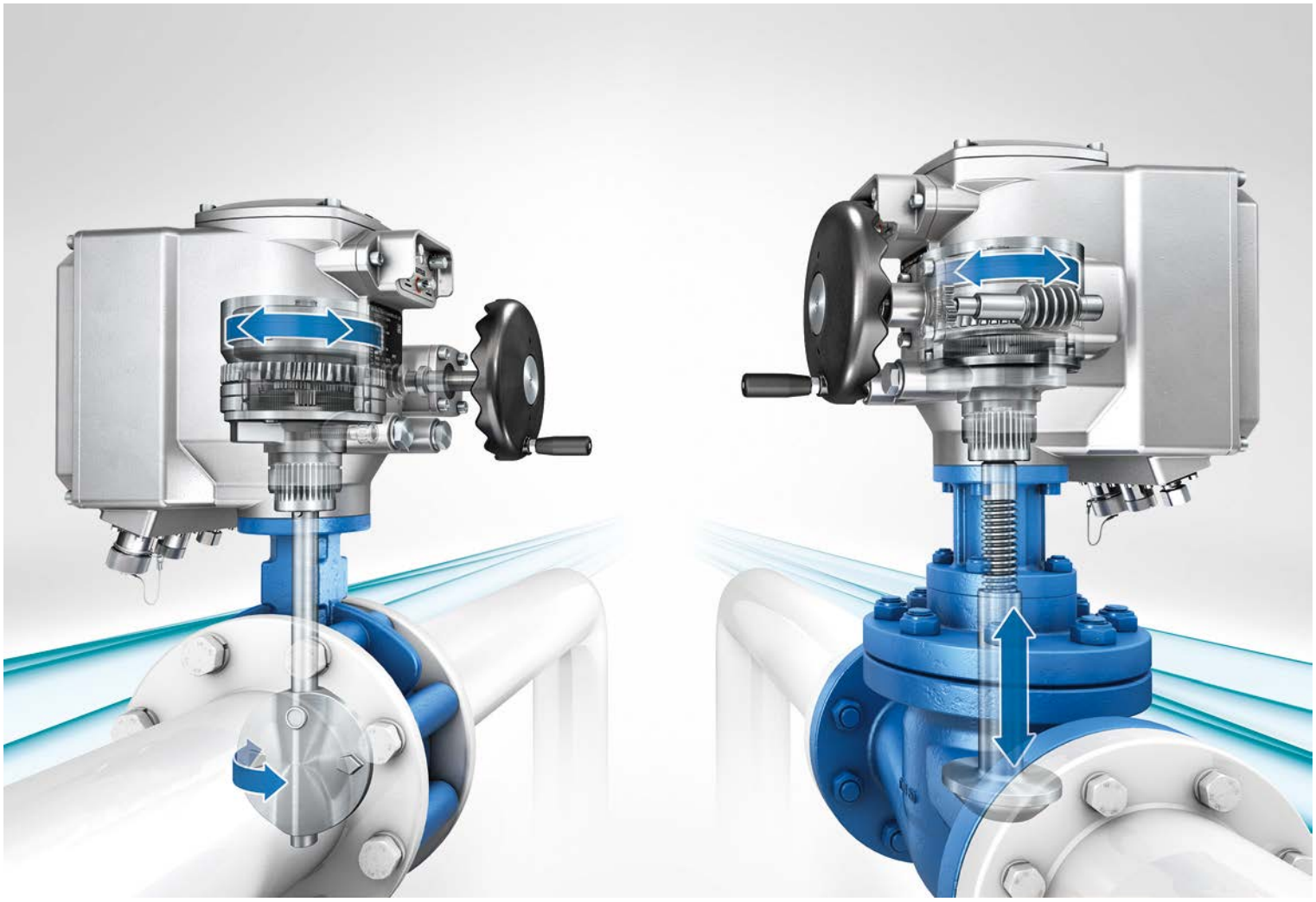


SMART RANGE - SGC PART-TURN / SVC GLOBE VALVE ACTUATORS

SGC part-turn actuators and SVC globe valve actuators excel by their compact design. Whenever high torques or operating forces in combination with high operating speeds are required, these actuators are the perfect choice. Variable speed provides excellent positioning accuracy.

Both actuator types are based on the same design principle, and follow the same pattern in terms of commissioning, integration into the DCS and subsequent operation. This facilitates joint operation of both type ranges within a single installation.

SGC and SVC are suitable for open-close duty, SGCR and SVCR versions for modulating duty.

Soft start and soft stop

Operations start at zero speed which is subsequently linearly increased until reaching the predefined speed. Soft stop is the exact opposite: Prior to reaching the target position, the speed is linearly decreased. The advantage is gentle service for all valve and actuator components subject to wear.

Higher positioning accuracy

For operation into the end position, the actuator decreases the operating speed when approaching the setpoint valve position down to zero speed. This allows for more accurate actuator positioning to the setpoint compared to the sudden tripping of a fixed speed actuator. This ability is particularly crucial for the SGCR and SVCR modulating duty models.

External impact on speed

The variable actuator speed is an additional control variable to optimise a control process within the control system. To this end, the actuator speed can be adjusted by an external input.

Extremely robust

Not only is AUMA spearheading technology with regard to ambient temperatures, corrosion protection and enclosure protection, the SGC and SVC type ranges are also resistant to vibration. This is due to the compact design and was particularly noted during tests proving the suitability of the devices for use on military vessels. The actuators are the optimum solution for applications with difficult usage conditions.

APPLICATION CONDITIONS FOR SGC/SGCR AND SVC/SVCR ACTUATORS

Corrosion protection
C5 according to EN ISO 12944-2

Ambient temperatures
> –25 °C to +70 °C

Enclosure protection
> IP68.
Submersible up to 8 m head of water up to 96 h at 10 operations during immersion.

Special approvals
> DNV GL
DNV GL certifies the suitability of the products for use in environmental categories D, G, EMC2.
> RMR (Russian Marine Register)
This certification proves the suitability of the products for use on civil ships and in offshore plants

SGC/SGCR PART-TURN ACTUATORS

Type	Operating time for 90° – adjustable in 9 steps	Setting range for tripping torque	Maximum run torque of SGC (open-close duty) Maximum modulating torque SGCR (modulating duty)	Number of starts max.	Output mounting flange	Adjustable swing angle range
	[s]	[Nm]	[Nm]	[1/h]	EN ISO 5211	
SGC/SGCR 04.1	4 – 63	25 – 63	32	1,800	F05/F07	82° – 98°
SGC/SGCR 05.1	4 – 63	50 – 125	63	1,800	F05/F07	82° – 98°
SGC/SGCR 07.1	4 – 63	100 – 250	125	1,800	F07	82° – 98°
SGC/SGCR 10.1	5.6 – 90	200 – 500	250	1,800	F10	82° – 98°
SGC/SGCR 12.1	20 – 275	400 – 1,000	500	1,800	F12	75° – 105°

SVC/SVCR GLOBE VALVE ACTUATORS

Type	Speed – adjustable in 9 steps	Setting range for tripping torque	Maximum run torque of SGC (open-close duty) Maximum modulating torque SGCR (modulating duty)	Number of starts Max. starts	Output mounting flange	Turns per stroke	Max. stem stroke for rising stem
	[rpm]	[Nm]	[Nm]	[1/h]	EN ISO 5211	in fractions	[mm]
SVC/SVCR 05.1	1.6 – 22	10 – 25	13	1,800	F05/F07	1 – 40	60
SVC/SVCR 07.1	1.6 – 22	20 – 50	25	1,800	F07	1 – 40	70
SVC/SVCR 07.5	0.6 – 8.0	40 – 100	50	1,800	F07	1 – 40	70

POWER SUPPLY

The actuators are operated with 1-phase AC current.

Voltage	Frequency
[V]	[Hz]
115	50/60
230	50/60

The operating times above apply to both 50 Hz and 60 Hz.

INTERFACES TO THE DISTRIBUTED CONTROL SYSTEM (DCS)

Parallel interface
> Four digital inputs
> One analogue input 0/4 – 20 mA for setpoint definition
> Four output contacts
> One analogue output 0 – 20 mA or 4 – 20 mA for position feedback

Fieldbus interfaces
> Profibus DP-V0
> Profibus DP-V0/V1
> Modbus RTU (line topology)
> Modbus RTU loop redundancy (loop topology)

1 Integral controls
The integral controls contain switchgear units, power supply unit, interface to the DCS and are designed to process commands from the DCS and supply feedback signals. The component automatically switches the actuator off once either the valve end position or the specified tripping torque has been reached.

Connection to the control system is either made via parallel interface or fieldbus. Profibus DP and Modbus RTU are available as fieldbus interfaces.

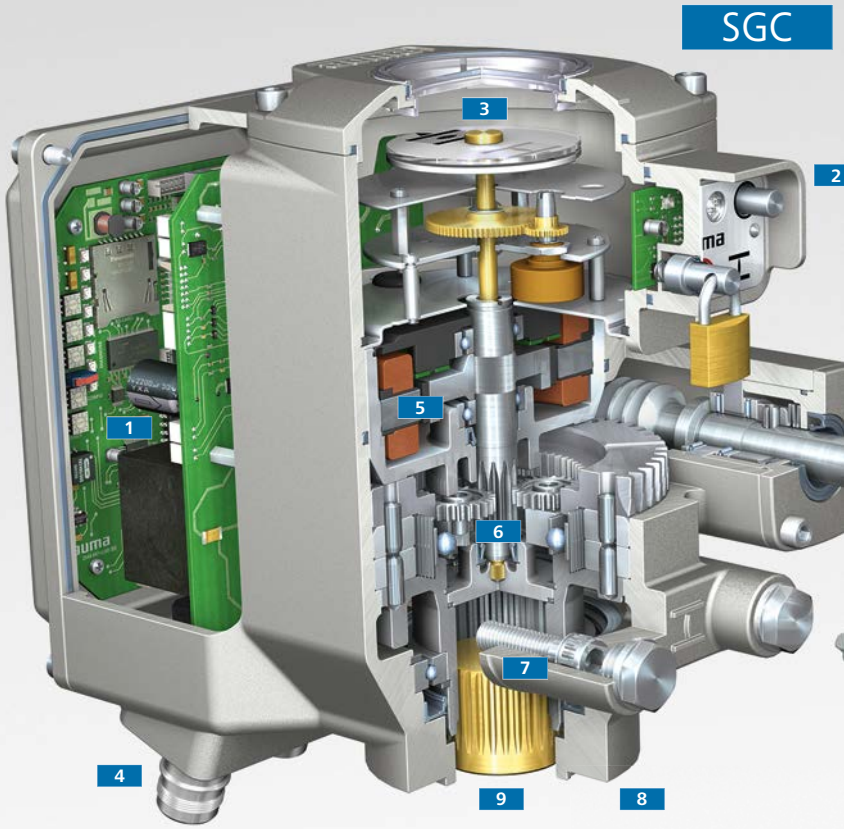
2 Local controls
The actuator can be operated locally via push buttons. One of the push buttons is used to select the control mode, i.e. the operator defines whether the actuator is operated via local controls or via DCS. A padlock protects the local controls against unauthorised use.

If the actuator is mounted in an inaccessible place or has space constraints, it is possible to mount the local controls separately from the actuator as an option. The connection is then made via cable.

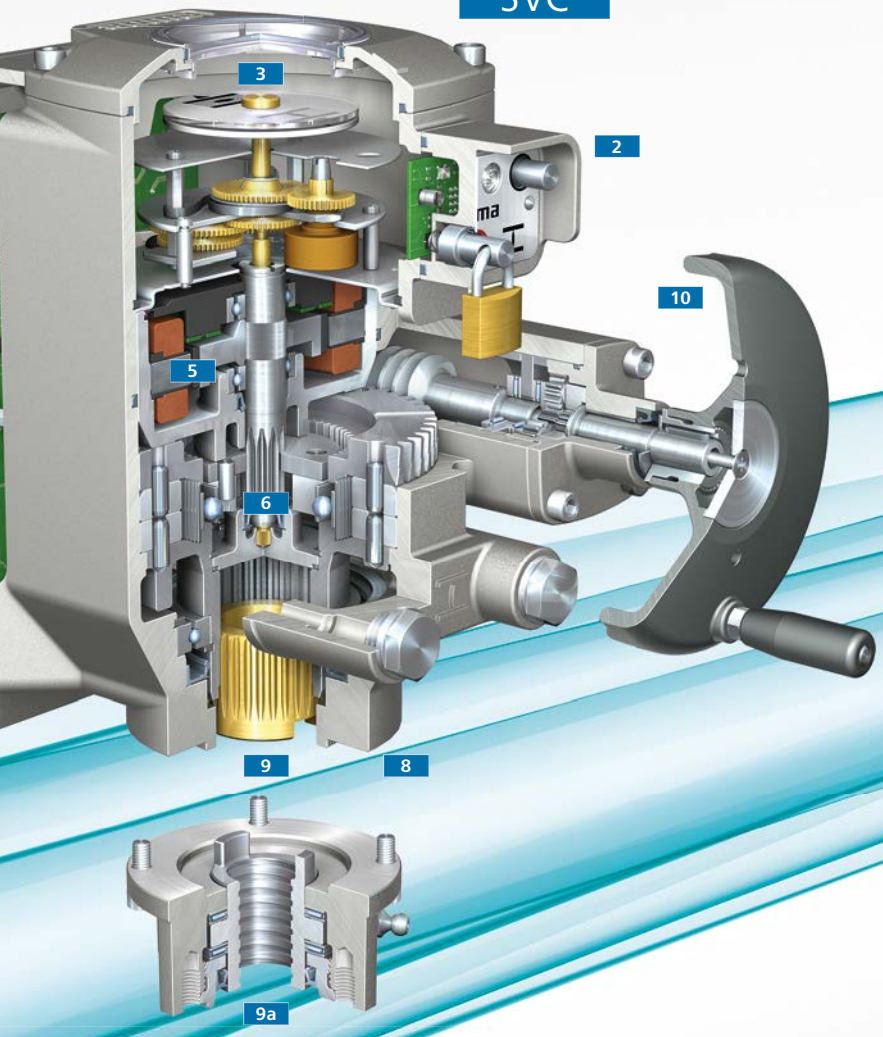
3 Position indication
The position indication provides the current valve position on local controls.

4 Electrical connection
The electrical connection of power supply and power cables is made via compact plug/socket connectors with crimp-type connection in the basic version. As an option, the actuators can be supplied with AUMA plug/socket connectors 4a. This connection is identical to that of the larger AUMA type ranges, SA and SQ.

5 Motor
The electronically settable variable-speed motor requires approximately one-third of the height of an equivalent conventional motor, thus contributing to the compact design of the actuator.



SVC



6 Gearing
Patented ellipto-centric gearing with premium efficiency. One stage 80:1 reduction gearing within a minimal space envelope.

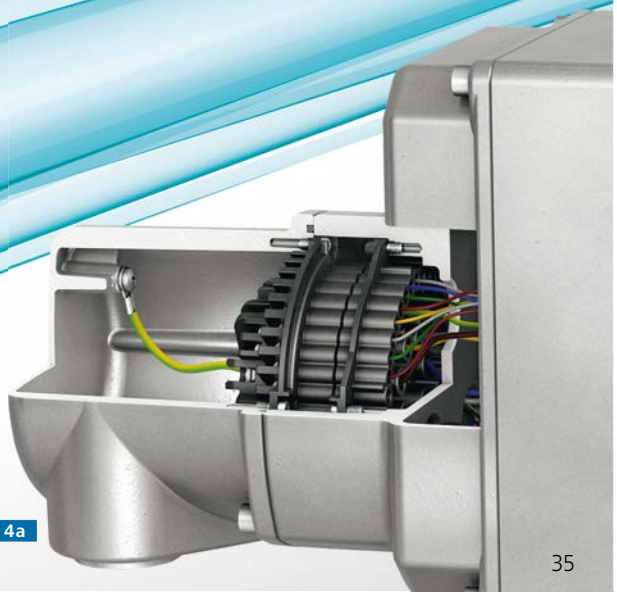
7 End stops (for SGC only)
During handwheel operation of part-turn valves without internal end stops such as multi-turn butterfly valves and ball valves, these integrated end stops enable precise approaching of end positions.

8 Valve attachment
The valve attachment for mounting on the valve is designed according to EN ISO 5211.

9 Coupling
The separate coupling transmits the torque applied to the valve shaft. During assembly, it is simply pushed onto the valve shaft and secured against axial movement. In the next step, the actuator or the gearing is placed onto the coupling and screwed to the valve flange. Upon request, the coupling is supplied with a suitable bore in accordance with the valve drive coupling.

In this setup, SVC actuators are particularly suited for automating valves with non-rising valve stems. For valves with rising non-rotating stems, the actuator is equipped with output drive type A 9a - threaded stem. The coupling is replaced by an output drive sleeve into which the rising stem is led.

10 Handwheel
Handwheel for emergency actuator operation in the event of power failure. The handwheel does not rotate during motor operation.



OTHER TYPE RANGES

Besides satisfying the requirements of the Division AUMA Industry & Marine, the AUMA product portfolio offers further devices meeting specific needs:

> Higher torques or operating forces
> Explosion protection
> Fire resistance
> Special enclosure protection
> Low and high temperature versions
> Fibre optic or Wireless communication
> Further fieldbus interfaces

SA/SQ RANGE

Multi-turn and part-turn actuator meeting a torque range of 10 Nm – 675,000 Nm. This wide range is an outstanding feature of this modular range family. This is also achieved in combination with valve gearboxes. In their basic version, the actuators are available with fixed speed and also in explosion-proof design.

All actuators can be supplied with or without actuator controls. Modern actuators are generally combined with integral actuator controls. AM actuator controls offer basic functions. However, the software-based AC provides comprehensive functions and a large variety of interfaces.

Open-close and modulating duty

In SA or SQ version, the actuators are suitable for open/close duty. In SAR or SQR version, the actuators are suitable for modulating duty.

Variable speed

AC actuator controls are also available with integral frequency converter - converting them into ACV. This feature allows that actuators of this type range can be operated at variable speed. This is required when customers demand premium positioning accuracy, soft start and stop or operation profile schemes.

Explosion protection

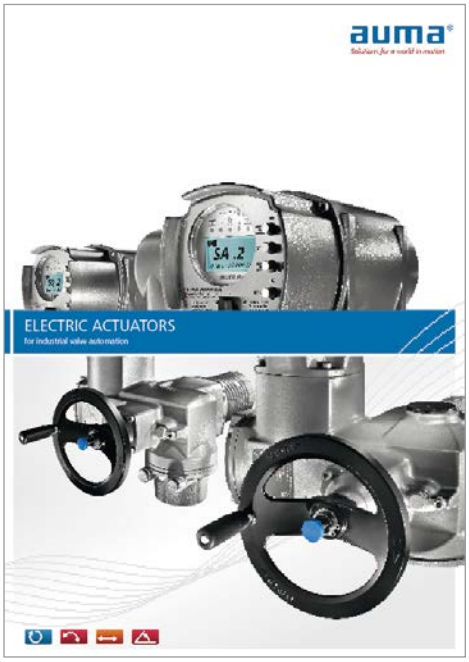
SAEx and SQEx are the type designations for the explosion-proof version of this product family. All required certifications are available to allow their worldwide use. In version SAREx and SQREx, these actuators are additionally designed for modulating duty.

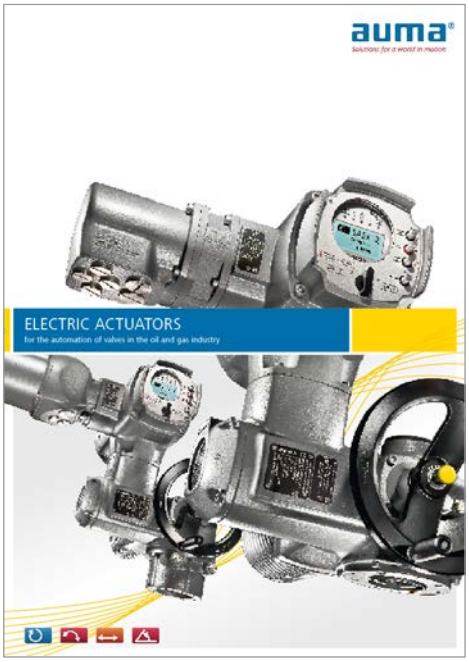
If required, the actuators can be supplied with special fire protection coating ensuring that safe actuator operation is guaranteed - in the event of fire - for a duration of minimum 30 minutes at temperatures up to 1,100 °C.

Brochures

For more detailed information on these actuators, please refer to the following brochures:

> Electric actuators for industrial valve automation
> Electric actuators for the automation of valves in the oil and gas industry





SA/SAR multi-turn actuators
Particularly suited for multi-turn valves.

> Eleven sizes
> Torque ranges:
10 Nm – 32,000 Nm

Applications: Shut-off and control gate valves with high differential pressures and/or large diameters.

SQ/SQR part-turn actuators
Particularly suited for part-turn valves.

> Five sizes
> Torque ranges:
50 Nm – 2,400 Nm
> Swing angle ranges:
15° – 225°

Applications: For automation of butterfly and ball valves in all process engineering schemes.

SA/GS part-turn actuator combinations
Combination consisting of SA multi-turn actuator and GS part-turn worm gearbox.

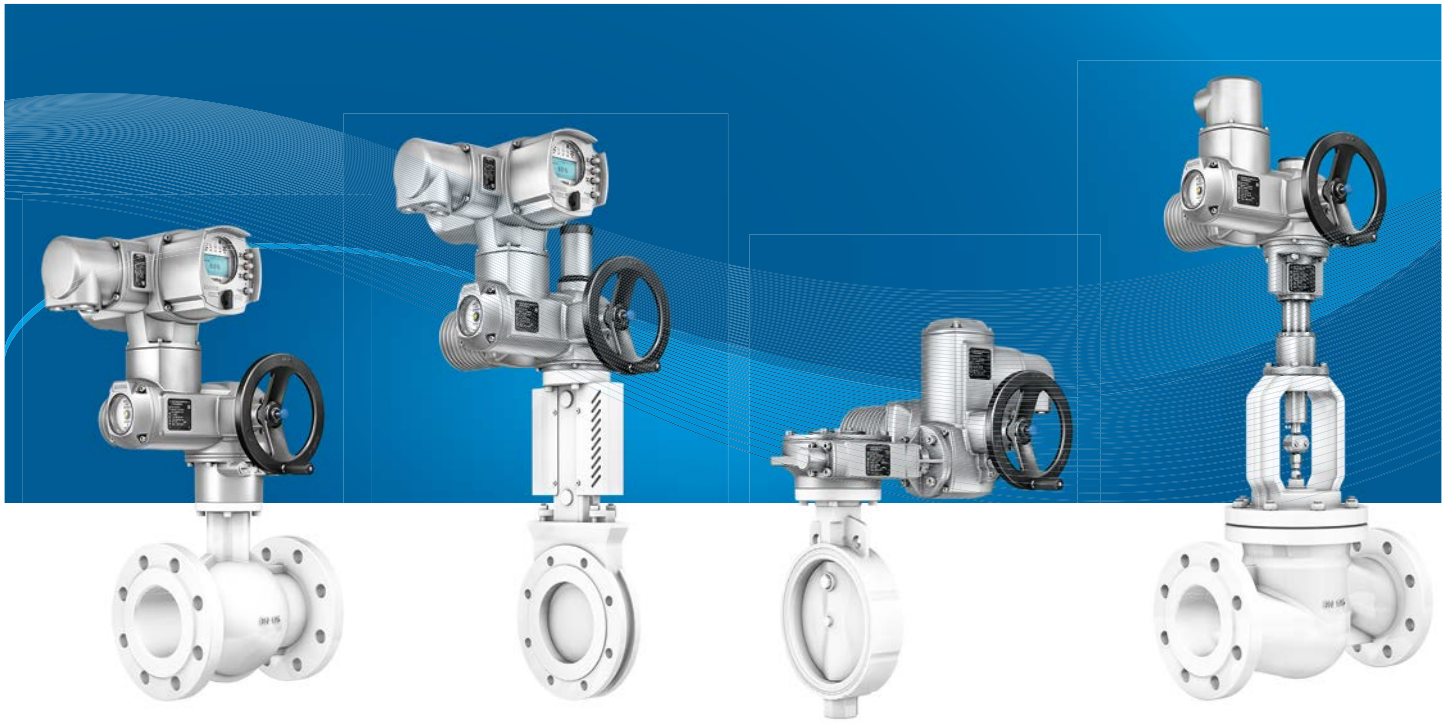
> Torques up to 675,000 Nm

Applications: Automation of butterfly and ball valves with diameters of several hundred metres

SA/LE linear actuator combinations
LE linear thrust units convert the rotary SA actuator movement into a linear movement.

> Thrust ranges:
11.5 kN – 217 kN
> Stroke ranges:
50 mm – 400 mm

Applications: Operation of shut-off and control valves requiring higher thrust



SERVICE

Reliability and dependability are the crucial factors in industrial plants. Sophisticated design and careful device manufacture are an absolute must – and a worldwide service network ensuring availability of our AUMA actuators throughout their complete product life.

> Global service

> Certifications

Advice and service throughout the entire product life

We at AUMA strive for long-term customer satisfaction and partnership by warranting the safe and smooth operation of our actuators. We attribute great importance to customised advice and comprehensive service – throughout our products' lifetime.

PRE & AFTER SALES SERVICE

EXPERTISE IN YOUR NEIGHBOURHOOD

We do not go for call centres with endless waiting loops or online device configuration systems with direct order placement. As soon as the automation requirements become more complex - and actuators are part of systems with different levels of complexity - the direct support and advice provided by our service staff cannot be replaced by automatic ordering systems. This is how we ensure that our customers select the suitable actuator solution.

AUMA's global service network with subsidiaries and representatives, established in 70 countries, is even subdivided in sections of competence at country level. The AUMA sales staff are informed about the latest developments by regular sales training.

Your special advantage: Competent support for AUMA products is available worldwide, helping you in selecting the suitable device - in your neighbourhood.

COMPREHENSIVE SERVICE

Whatever applies to customer support also applies to customer service. Our sales network also acts as service network. We always care for you and our products.

Our service engineers know the AUMA devices by heart and their technical expertise in the field of device deployment is common knowledge. A best practice database is available for the AUMA service network, beneficial for both, the service staff and the customers.

Our AUMA service offers our customers all around the globe comprehensive service performance for actuators, actuator controls, and gearboxes. With our versatile service portfolio, we are your competent partner from installation and commissioning to training, maintenance, and overhaul or repair right through to global availability and supply of spare parts.

We guarantee availability for spare parts for at least 10 years after discontinuation of a product.

TAILORED MAINTENANCE

Preventive maintenance maximises plant availability. In compliance with the specified application conditions, we develop individual and tailored maintenance plans.

RETROFITTING AND CUSTOMISED PRODUCTION

There is no such thing as "impossible" with AUMA. Special and challenging installation conditions require special and customised solutions: Especially for buried service or when modernising existing plants where valve attachments are frequently not complying with standards. We offer extensive accessories and manufacture pedestals, lever arrangements, and other adapters to customer needs.

QUALITY IS NOT JUST A MATTER OF TRUST

Actuators must be reliable and dependable. They determine the cycle of precisely defined work processes. Reliability does not begin during commissioning.

For AUMA, this commences with a well-thought out design, careful selection of material used and conscientious production using state-of-the-art machinery. With clearly controlled and supervised production steps we pay close attention to the environment.

The importance of environmentally sound production is reflected in our certifications according to ISO 9001 and ISO 14001.

However, quality management is no one-time or static matter. It has to be proven day by day. Numerous audits by our customers and independent institutes confirm these high standards.

ZERTIFIKAT ■ CERTIFICATE ■ 認證證書 ■ СЕРТИФИКАТ ■ CERTIFICADO ■ CERTIFICAT

TÜV SÜD Management Service

CERTIFICATE

The Certification Body
of TÜV SÜD Management Service GmbH

certifies that

auma®

AUMA Riester GmbH & Co. KG
Aumastr. 1, 79379 Müllheim
Germany

has established and applies a
Quality, Environmental,
Occupational Health and Safety Management System
for the following scope of application:

Design and development, manufacture, sales and service of electric actuators, integral controls and gearboxes for valve automation as well as components for general actuation technology.

Performance of audits (Report-No. 70009378)
has furnished proof that the requirements under:

ISO 9001:2008
ISO 14001:2004
OHSAS 18001:2007

are fulfilled. The certificate is valid in conjunction
with the main certificate from **2015-06-09** until **2018-06-08**.

Certificate Registration No. **12 100/104/116 4269/01 TMS**

Product Compliance Management
Munich, 2015-06-09

DAkkS Deutsche Akkreditierungsstelle
D-ZM-14143-01-03
D-ZM-14143-01-04
D-ZM-14143-01-05

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TÜV®

EU DIRECTIVES

Declaration of Incorporation in compliance with the Machinery Directive and Declaration of Conformity according to the Low Voltage and EMC Directives.

According to the Machinery Directive, AUMA actuators and valve gearboxes are considered as partly completed machinery. By means of the Declaration of Incorporation, AUMA certify that during the design stage of the devices, the fundamental safety requirements stipulated in the Machinery Directive were applied.

AUMA actuators fulfil the requirements of the Low Voltage and EMC Directives. This has been proved in various exams and extensive tests. Consequently, AUMA issue a Declaration of Conformity in compliance with the Low Voltage and EMC Directives.

Declarations of Incorporation and of Conformity are combined in a single certificate.

According to the Low Voltage and EMC directives, the devices are labelled with the CE mark.

CE

CERTIFICATES

Notified bodies perform type tests on the actuators to prove whether the devices are suitable for specifically defined applications. One example are the tests to prove electrical safety for the North American market. For all devices mentioned in this brochure, relevant certificates are available.

Where can I get the certificates?
All confirmations, records and certificates are filed at AUMA and provided as printed or digital version on request.

The documents can be downloaded from the AUMA website at any time; some of them are password protected.

> www.auma.com

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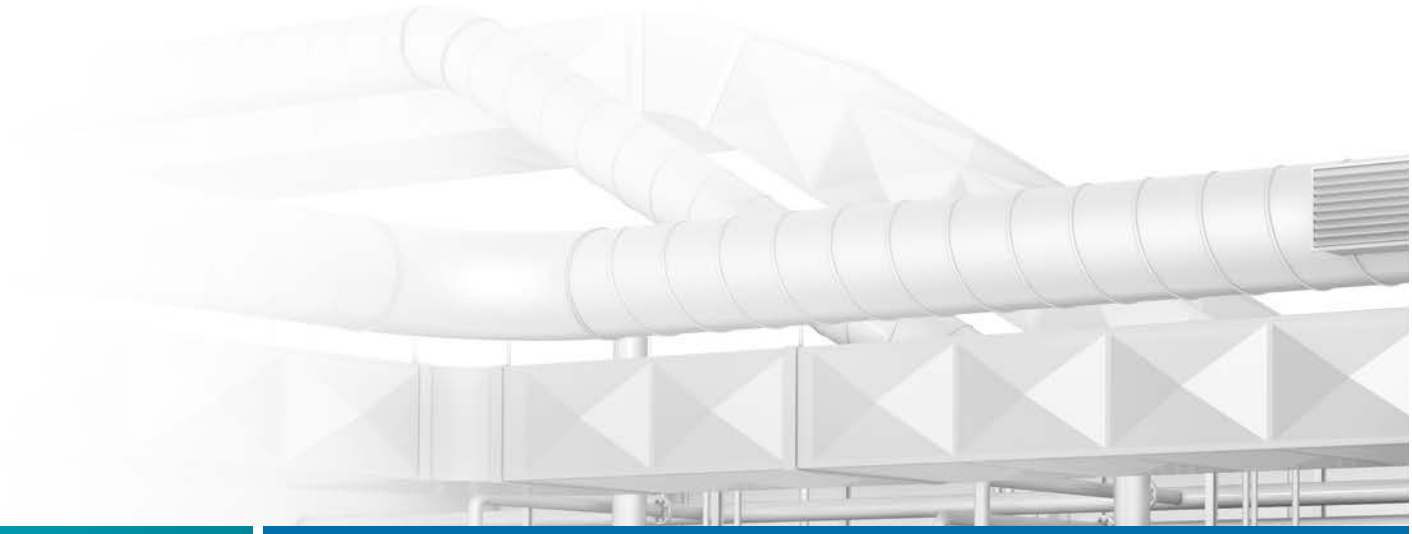
Solutions for a world in motion



AUMA Industry & Marine GmbH
Eichendorffstr. 42 – 48
78054 Villingen-Schwenningen
Germany
Tel +49 7720 8540-0
Fax +49 7720 8540-50
info.industry-marine@auma.com

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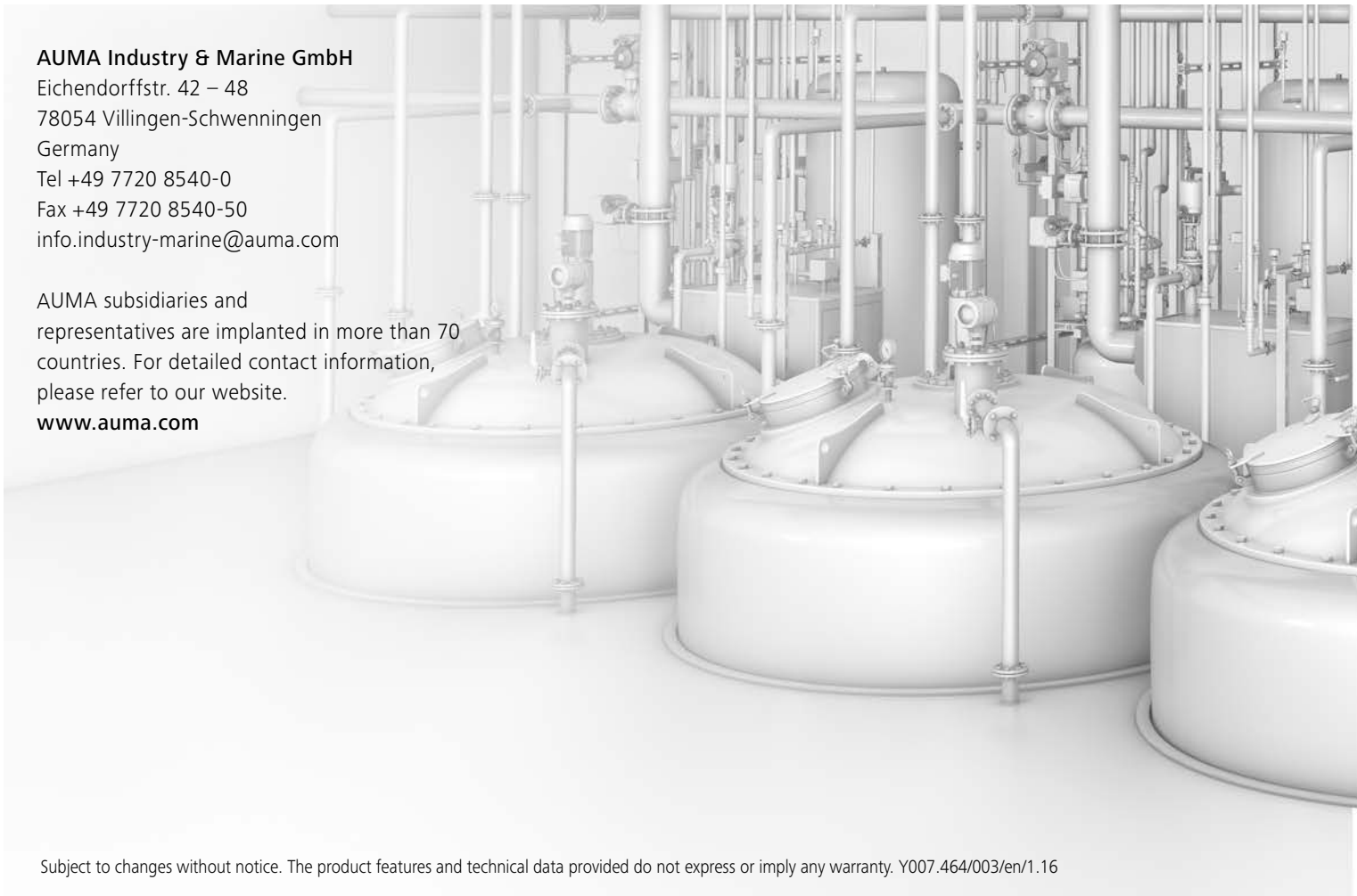
www.auma.com



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ELECTRICAL ACTUATORS